SUBHOT
INDUSTRIAL HEATERS

SILICONE CARBIDE HEATER

Specialist In: Custom Built Heaters & Heater Assembly Unit Along-With Temperature Controller As Per Customer's Specification.

MAKE IN INDIA

AN ISO 9001:2015 COMPANY

NSIC CERTIFIED CO. | CE | ZED Zero Effect Zero Defect | D&B Decide with Confidence | IAF MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT | eiaCI 035-CB-QMS | GeM Government e Marketplace

www.subhotheater.com

+91 9999710410, 9311163794, sales@subhotheaters.com, info@subhotheaters.com

51/10, Madhuban Bapudham Industrial Area, Meerut Road, Ghaziabad, Uttar Pradesh 201013

Company Profile

"SUBHOT" the brand name of **Three Decades Rich**, quality oriented and completely indigenously manufactured IEC standard product since 1990, we are catering successfully to domestic and international Industries. We design develop and supply industrial heaters, heating elements, thermocouples and other high temperature Material Management equipments as per the customer's requirement. We have in house Design, Development & research facilities, follows by stringent quality control measures right from beginning to delivery of the material. Customer satisfaction is our first priority.

We manufactur various types of Tubular Electrical Heaters and heating systems, along with control accessories Cartridge Heaters, Mica Band Heaters, Ceramic Band Heaters, Casted Heaters, Furnace Heaters, Nozzle Heaters, Coil heaters, which are used in Hazardous and Non Hazardous area. In Tubular Electrical heater Heating element is Mineral filled sheathed tubular type. Heating element Insulation material used is Mgo (Magnesium oxide) and heating element wire material is Nichrome. Heating elements are manufactured and tested as per IS-4159 BIS Standards. Electrical heaters are suitable for application for Water, Oil, Chemical, Air, Fuel gas, Natural gases etc and Design as per requirement of customer based on the technical input provided by them. Heating unit consist of Heater vessel, Heater bundle, Terminal box, and U-Shaped heating element fitted on Tube sheet .The selection of heating element for a particular assembly depends on the uses & customers requirement total rating, surface loading, diameter of heating element tube, Operating temperature, space limitation, Type of electrical connection and number of bank etc. The heating element can be permanently fixed on tube sheet OR Can be removable type. Various Sheath material and sizes are available based on design requirement. The heating unit can be supplies Complete with Heater Vessel, Inlet-Outlet Nozzle/Flange, Lug Support and external insulation.

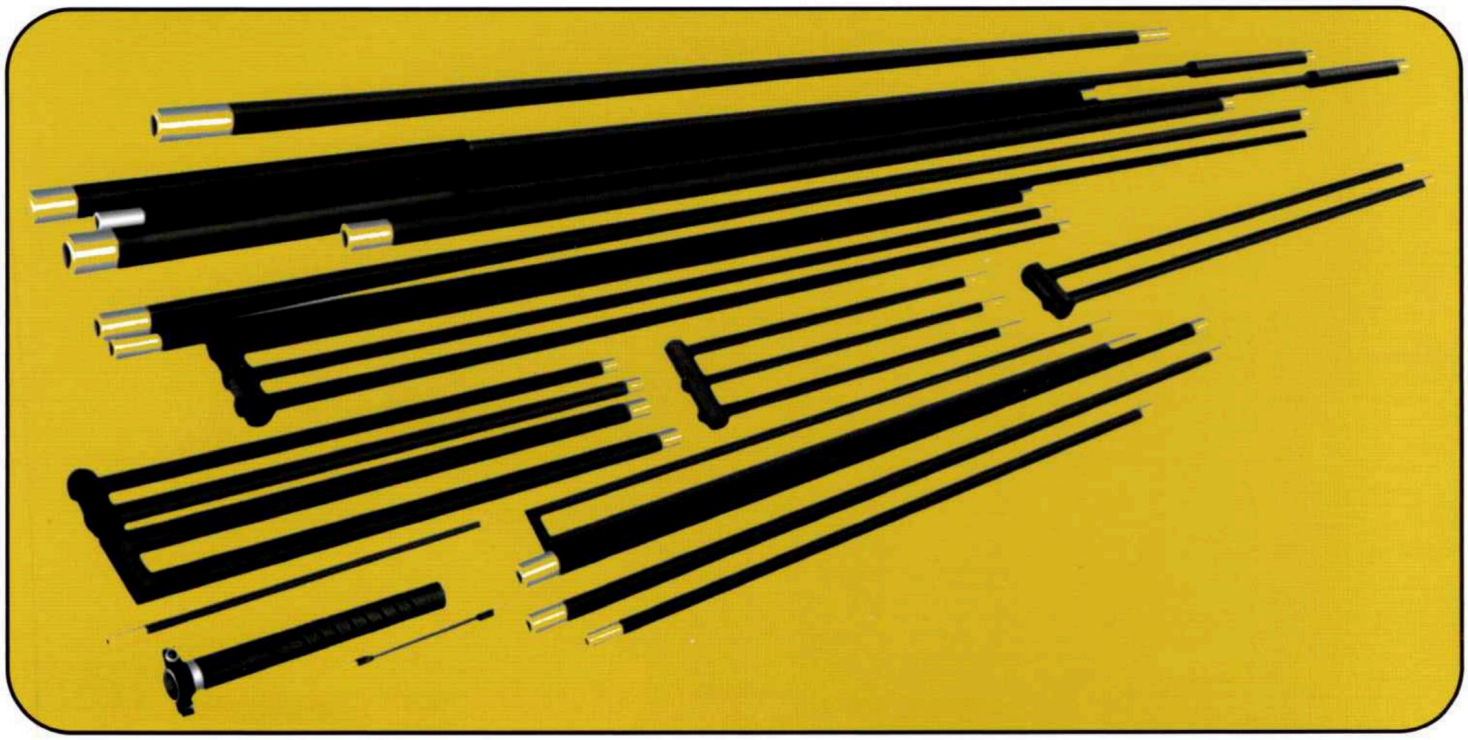
Heater vessels are generally designed as per ASME SecVIII Div-1. For Hazardous area flameproof terminal box are used which are duly certified by CMRI Dhanabad for Gas group IIA, IIB or IIC.

We are also manufacturing the following product at our works:

- Immersion heating elements for Water, Oil and Chemical heating.
- Air Heating element
- Fuel gas and Process gas heater.
- Regeneration heaters.
- Large heating unit upto 520KW with terminal box and control panel.
- Heater for ESP and Ash handling system.
- Cartridge Heaters
- Mica Band Heaters
- Ceramic Band Heaters
- Casted Heaters
- Furnace Heaters

Size of heating tube: 8.2mm, 9.5mm, 11.0mm, 12.0mm, 12.5mm, and 16.0mm,19.0 mm or as per customer requirement.
MOC of Heating Tube: Copper, Titanium, SS all grade, Incoloy 800,Inconel etc.
Sizing of Tube Sheet: As per design requirement.
Sizing of Heater Vessel: As per design requirement.
Thermocouple: J & K Type own make in SS all grade and Incoloy.

Silicon Carbide Heating element

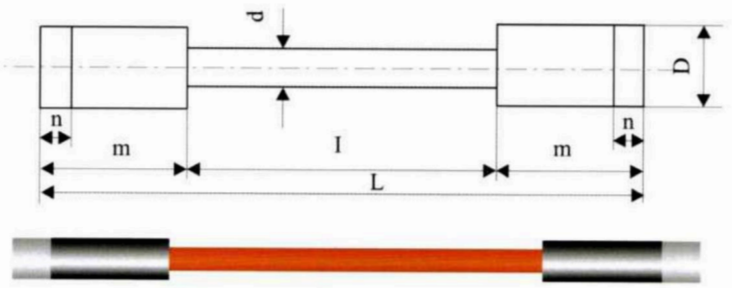


Product Introduction

"SUBHOT" silicon carbide heating elements is a company with unique formula and advanced production technology and manufacturing. With the cold end resistance is very small, the hot end red uniform, good oxidation resistance, strong corrosion resistance, good thermal shock resistance, thermal expansion coefficient, good creep resistance, radiation ability, fast heating speed, high thermal efficiency, easy installation and maintenance characteristics, widely used in metallurgy, machinery, chemical, semiconductor, ceramics, galss, food and textile industry etc

"SUBHOT" silicon carbide electric heating elements maximum temperature of up to 1600 degrees, can be used for furnace temperature between 600-1500 degrees of electric furnace and electric tunnel kiln. Production of diameter 8mm-70mm, length 300-6000mm of different specifications of silicon carbide. **"SUBHOT"** silicon carbide electric heating elements of all varieties, excellent quality, low price, the products are sold all over the country,

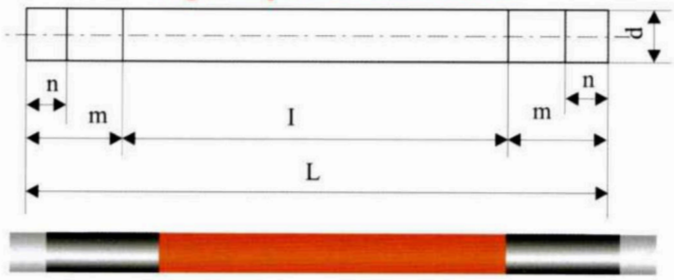
GC-Type Silicon Carbide rod



Marks:GC: d/i/m/D If the two ends of the cold ends are not equal, GC: d/lm1/m2/D

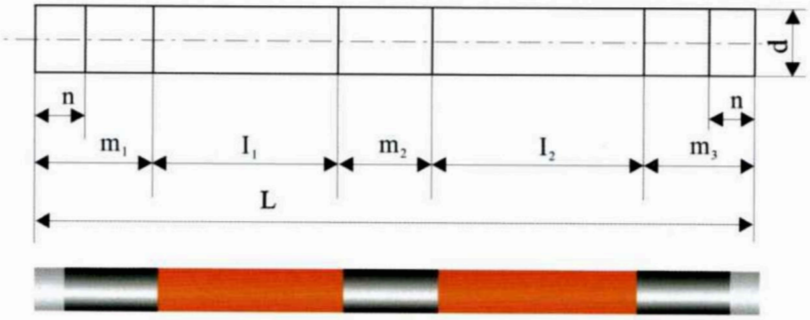
GD-Type Silicon Carbide rod (equal diameter type sic rod)

Single temperature zone sic rods



Marks:GD: d/i/m If the two ends of the cold ends are not equal, GD: d/Im1/m2

GD-Type Double-temperature-zone Silicon carbide rods (five-section rods)

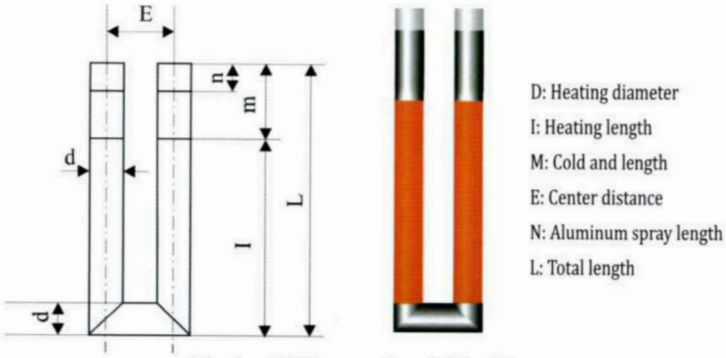


D: Heating diameter
m1/m2/m3: Cold and length
I1/l2: Heating length
N: Aluminum spray length
L: Total length

Marks:GD- Type Double-temperature-zone silicon carbide rods (five-section rods) d/m1/l1/m2/l2/m3

D: Heating diameter | **I:** Heating length | **M:** Cold and length | **D:** Cold and diameter | **N:** Aluminum spray length | **L:** Total length

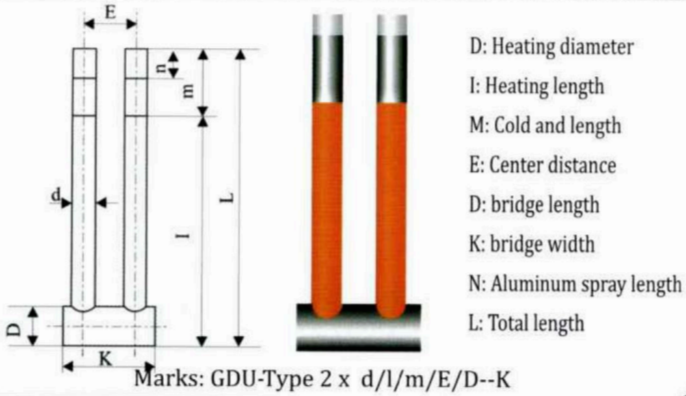
GDU-Type silicon carbide rod



D: Heating diameter
I: Heating length
M: Cold and length
E: Center distance
N: Aluminum spray length
L: Total length

Marks: GDU-type : 2 x d/l/m/E

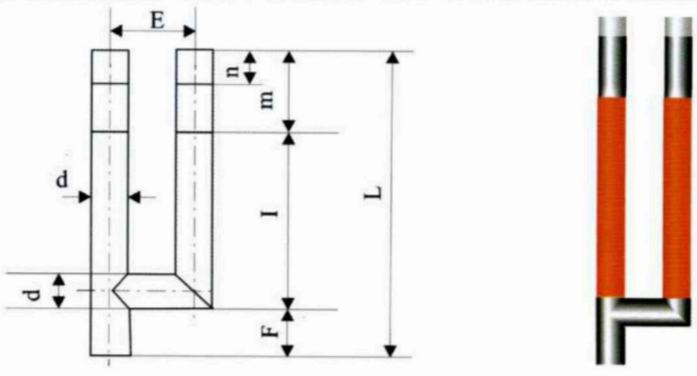
GDU-Type Silicon Carbide rod



D: Heating diameter
I: Heating length
M: Cold and length
E: Center distance
D: bridge length
K: bridge width
N: Aluminum spray length
L: Total length

Marks: GDU-Type 2 x d/l/m/E/D--K

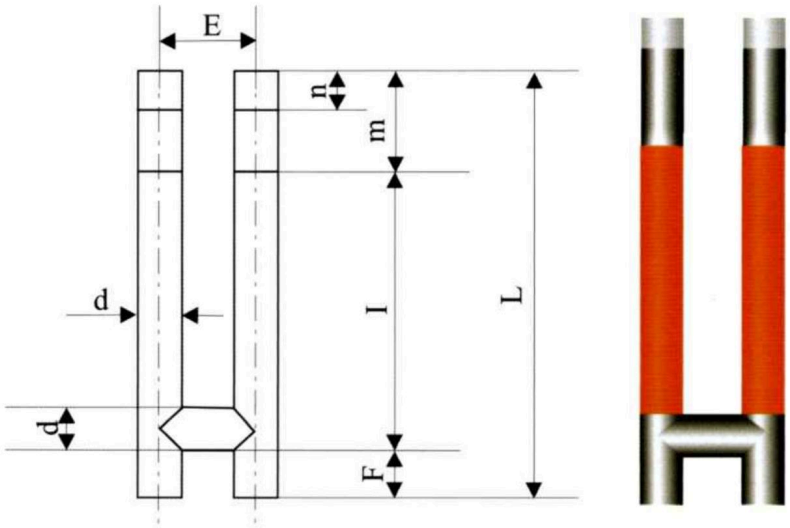
GUN-Type Silicon Carbide rod



D: Heating diameter
I: Heating length
M: Cold and length
E: Center distance
F: extension length
N: Aluminum spray length
L: Total length

Marks: GDU-Type 2 x d/l/m/E--F

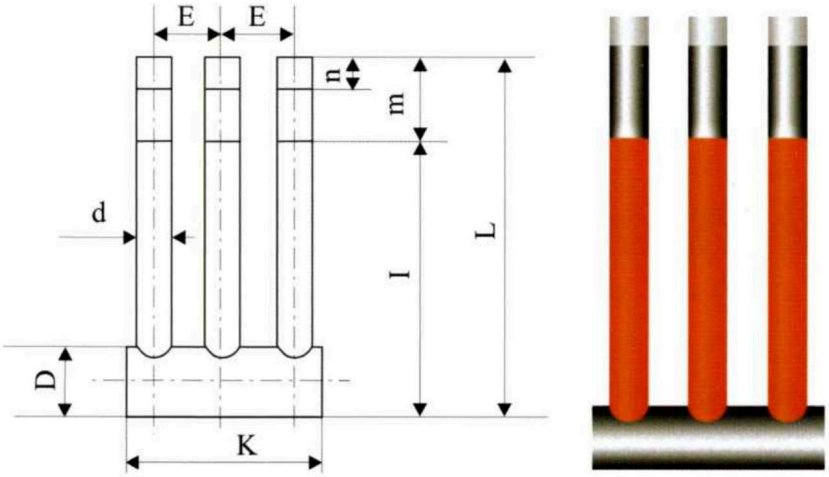
H-Type silicon carbide rod



D: Heating diameter
I: Heating length
M: Cold and length
E: Center distance
F: extension length
N: Aluminum spray length
L: Total length

Marks: H-type: 2 x d/l/m/E--F

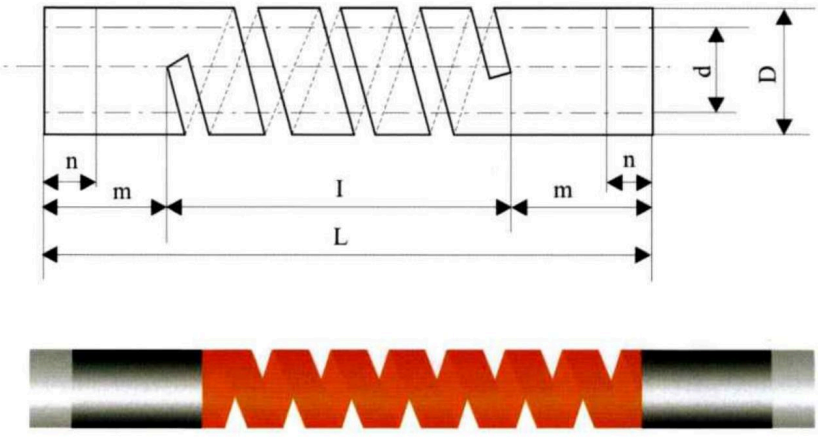
GDS-Type Silicon Carbide rod (triphase rod)



D: Heating diameter
I: Heating length
M: Cold and length
E: Center distance
D: external diameter of bridge
K: bridge width
N: Aluminum spray length
L: Total length

Marks: GDU-Type: 2 x d/l/m/D--K

GUN-Type Silicon Carbide rod



D: Outer diameter
D: Tube diameter
I: Heating part
M: Cold end
N: spray aluminum length
L: Total length

Marks: single threaded silicon carbon tube D/dx1xm

Chemical property

Chemical composition:

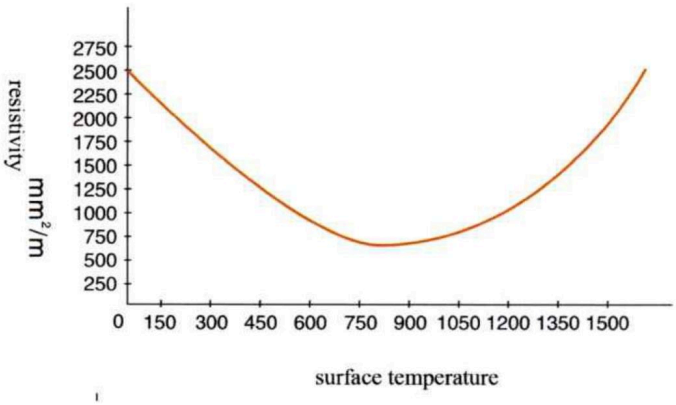
Silicon carbide is recrystallized silicon carbide products at high temperature, is a kind of non metal high temperature electric heating element.

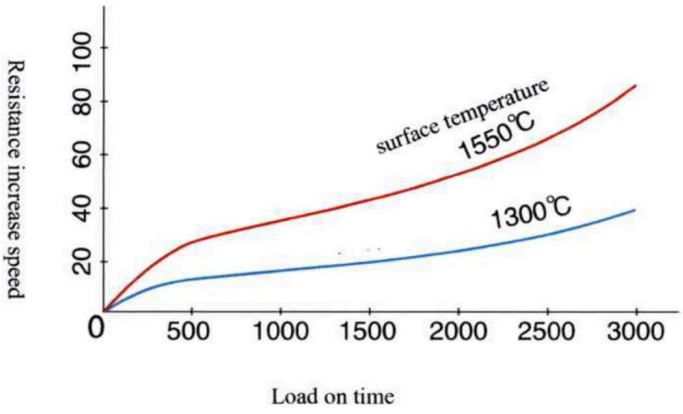
Chemical composition of silicon carbide heating part belows:

Physical property

Item	Unit	Value
Density	g/cm^3	≧ 2.6
Porosity	%	18.20
Flexural Strength	Mpa	≧ 50
Hardness	mohs	9.8
Thermal Expansion	10-^6K^{-1}	4.8
Specific Heat	°C	0.183
Thermal Conductivity	°C	0.0365
Heating Resistivity(1050°C)	mm^2/m	700-1500
cold and Resistivity (20°C)	mm^2/m	18-24
Emissivity		0.9

	SiC	Fe_2O_5	Al_2O_3	$Si+SiO_2$	C
%		≧0.5	≧0.2	≧0.4	≧0.3





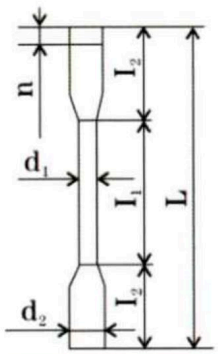
1. The Resistance value of silicon carbide largely affected by temperature. Between 0.850°C the resistance temperature is negative, above 850°C present positive value.
The resistance is measured at the temperature of 1050°C ± 50°C.
2. Characterisitic curve of the temperature resistance. With the increase of the temperature, it show a nonlinear variation.
3. Mode of connection: Triangle ( ) connection; star (Y) connection; Series connection ; Parallel connection; Parallel series; String association.
4. The relationship between the surface temperature resistance and the speed of increasing.
5. The relationship between carbon surface temperature, furnace temperature, the density of surface load.

w/cm²	1400	1300	1200	1100	1000	900	800	700	600	500	400	300	200	100
1500	10.23	18.74	25.88	31.65	36.27	39.95	42.78	44.93	46.50	47.62	48.38	48.86	49.16	49.31
1400		8.55	15.61	21.40	26.02	29.70	32.50	34.67	36.25	37.28	38.13	38.61	38.90	39.06
1300			7.05	12.85	17.47	21.15	23.35	26.12	27.70	28.82	29.58	30.06	30.35	30.51
1200				5.79	10.41	14.09	16.83	19.06	20.64	21.74	22.52	23.00	23.23	23.45
1100					4.62	8.30	11.10	13.27	14.85	15.86	16.73	17.21	17.50	17.66
1000						3.68	6.48	8.65	10.23	11.35	12.11	12.59	12.88	13.04
900							2.80	4.97	6.55	7.67	8.43	8.91	9.20	9.36
800								2.17	3.75	4.87	5.63	6.11	6.40	6.56
700									1.58	2.70	3.46	3.94	4.23	4.39
600										1.12	1.88	2.36	2.65	2.81
500											*0.76*	*1.25*	*1.54*	*1.69*

MoSi2 Heating element

Introduction

MoSi2 heating element is a comprehensive production technology in domestic and abroad. The utility model is a high temperature electric heating element which is made of two molybdenum silicide, The utility model is matched with the heating mode, and the maximum temperature is up to 1850°C Components are widely used in metallurgy, glass, electronics, ceramics, magnetic materials, refractories and other industries. According to the shape can be divided into I type, U type, W type, can also be made according to customer needs, right angle, bending angle and other special-shaped products.



GM-I Type

Marks : GM-1d_1 l_1l_2

l_1: Hot and length

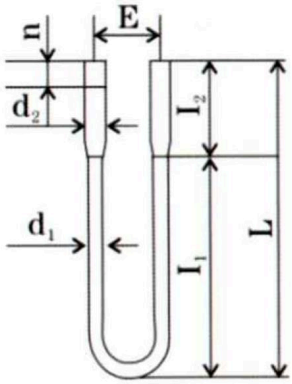
l_2: Cold and length

d_1: Hot and diameter

d_1: Cold and diameter

n: Aluminum spray length

L: Overall length



GM-U Type

Marks : GM-U d_1 l_1l_2/E

l_1: Hot and length

l_2: Cold and length

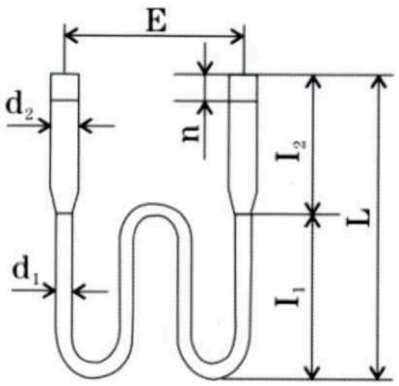
d_1: Hot and diameter

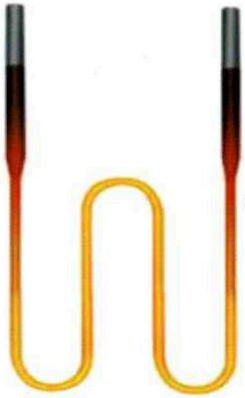
d_1: Cold and diameter

E: Center distance

n: Aluminum spray length

L: Overall length





GM-W Type

Marks : GM-W d_1 l_1l_2/E

l_1: Hot and length

l_2: Cold and length

d_1: Hot and diameter

d_1: Cold and diameter

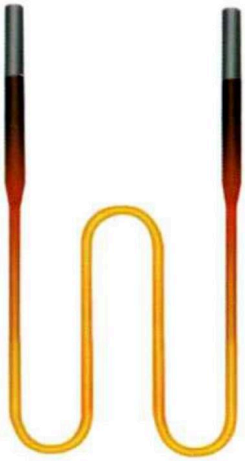
E: Center distance

n: Aluminum spray length

L: Overall length

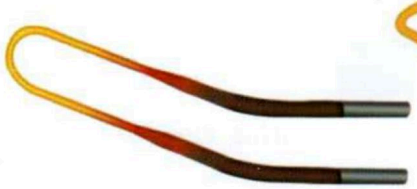
GM-I Type

GM-U Type

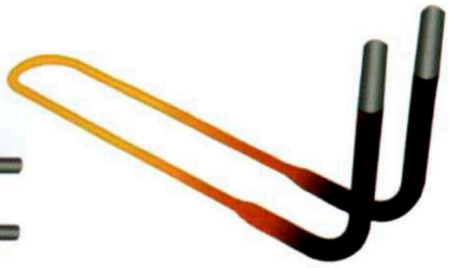


GM-W Type

GM-Right Angle



GM-Bending Angle



GM-Special -shaped

Clamping Apparatus

Physical Property

The components are both hard and brittle at high temperature, and the flexural strength is low. The element is softer heating to 1350°C, can be bent into a desired shape at high temperature.

Density	Repture Strength	Vickers Hardness	Stomatal Number	Water Absorption	Thermal Extension Length
5.6g/cm³	≧1.5g/cm³	1200g/cm³	7.4%	1.2%	4-5%

Chemical Property

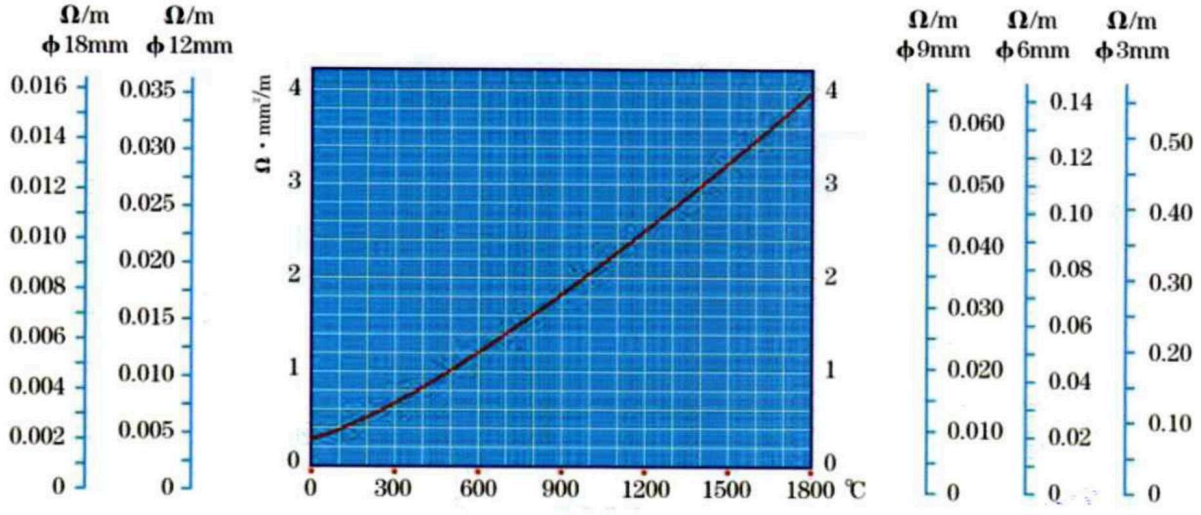
The element is heated to a high temperature under the oxidizing atmosphere, and the surface a formed with a dense silicon dioxide protective layer, so as to prevent the oxidation of the silicon dioxide. The components should not be used for a long time in the range of 400-700, because under this condition, the element will be oxidized at low temperature, resulting in the destruction of components.

The operating temperature of components in different atmospheres:

Furnace atmosphere	Maximum operating temperature
NO_2 Co_2 O_2 Air	1800°C
HE Ar Ne	1750°C
So_2	1700°C
CO N2	1600°C
wet H_2	1500°C
dry H_2	1450°C

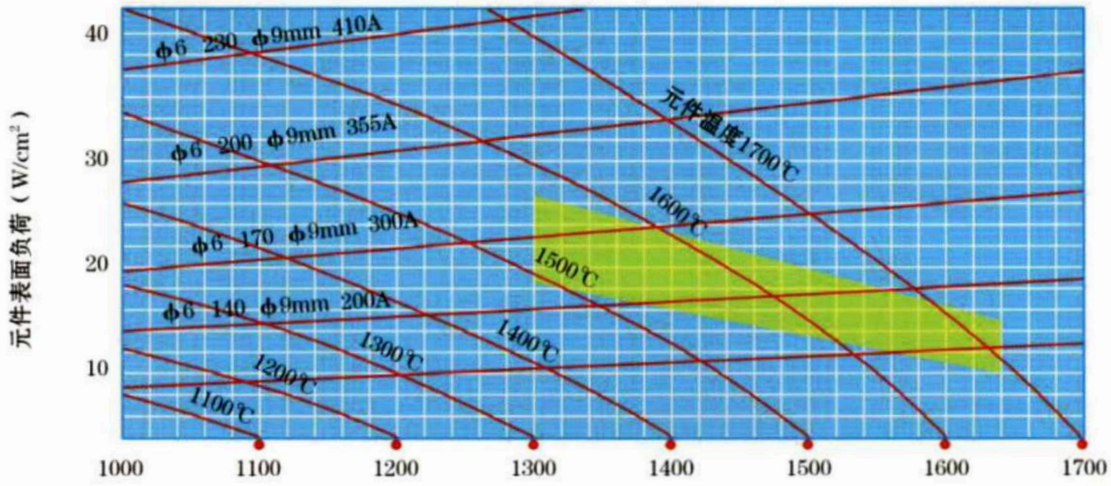
Resistance Characteristics

The resistance of molybdenum silicide electric heating element increases rapidly with the increase of temperature. Under normal circumstances, the component resistance does not change with the length of operating time, so the new and old components can be mixed use.



Surface Load

According to the structure of the furnace, furnace atmosphere and furnace temperature, the correct choice of components and surface load is the key to achieve the longest life. The following diagram shows the relationship between furnace atmosphere, the temperature of the element and the surface load under the condition of the non thermal radiation.



Installation

Components at room temperature is brittleness, high temperature and plasticity, so the product is generally made of U vertical suspension installation. According to the need and the heating module complete collocation, can also use other installation method. When the installation of the part of the cone must be extended to the furnace, the cold and of the fixture can not be screwed too tight at the begining time, to be elevated to the high temperature when the screw again, because when the component is not easy to break a certain plastic. In order to prevent the vertical component and the bottom contact, the distance between the component and the bottom should not be less then 25mm.

The thermal insulation performance of electric furnace roof must be better and the temperature of the furnace top should not exceed 300 centigrade. In order to prevent the chuck from overheating, the contact voltage between the clamping wire and the component should be less then 0.1V, and the distance between the lower and of the chuck and the stopper should not be less then 50mm. In order o avoid damage to chuck, general 6/12mm components can be used for long time under 170A the 9/18mm element can be used for long time under 300A.